Dunes and Bluffs

♦ *Facilitators*:
Charles Lester, California Coastal Commission
♦ *Rapporteurs*:
Karen Grimmer, Monterey Bay National Marine Sanctuary
Maris Sidenstecker, Monterey Bay National Marine Sanctuary
♦ *Participants*:
John Dingler, United States Geological Survey
Joey Dorrell-Canepa, Consultant and Pebble Beach Co.
Joanne Kerbavaz, California State Parks
Kriss Newman, Point Reyes Bird Observatory
Peter Slattery, Moss Landing Marine Labs
Ed Thornton, Naval Postgraduate School

♦ *Priority Issues*:
- Rare and sensitive species
- Invasive species
- Cliff and dune erosion
- Identifying desired conditions
- Constraints on natural processes
- Prioritizing sensitive areas
- Impact of human access / exclusion zones
- Basic understanding of coastal structures and processes

♦ *Characterization of Priority Questions*:

What is the abundance and distribution of invasive dune and bluff species?
Parameters - Invasive and natural species, biodiversity and rate of change in community structure
Methods - Standard quantified transect/quadrat surveys, hyperspectral aerial surveys, aerial photos and mapping on GIS
Spatial Scale - All dunes and bluffs, or focus on most developed/visited versus most pristine
Temporal Scale - Decades
Frequency - Annual
Existing Data/Programs - Herbaria, Native Plant Society, State Parks, CalEPSI

What is the abundance and distributions of sensitive dune and bluff species?
Parameters - Sensitive and listed species, biodiversity and rate of change in community structure
Methods - Standard quantified transect/quadrat surveys, hyperspectral aerial surveys, aerial photos and mapping on GIS
Spatial Scale - All dunes and bluffs, or focus on most developed/visited versus most pristine
Temporal Scale - Decades
Frequency - Annual
Existing Data/Programs - Herbaria, Native Plant Society, State Parks

What are the rates and causes of dune and bluff erosion over time?
Parameters - Spatial locations of cliff edge and dune morphology, characterization of rock and sediment type
Methods - LIDAR, aerial photo surveys and field surveys, comparisons of developed versus non developed regions and mapping on GIS
Spatial Scale - All dunes and bluffs of the Sanctuary
Temporal Scale - Several decades, indefinitely
Frequency - Beach surveys several times a year and around large storm events, LIDAR every 2 years, aerial photos every year and comparison with historic records and photos

How has the distribution and structure of buff and dune systems change on long-term time scales?
Parameters - Spatial locations of cliff edge and dune morphology, species distribution and abundance
Methods - Core samples of dunes and bluffs for long-term (1000 year) perspective and compare current conditions with historic surveys and photos
Spatial Scale - All dunes and bluffs of the Sanctuary
Temporal Scale - Hundreds of years
Frequency - Once for all important locations

What are the impacts of human activities?
* Using the above characterizations A) compare developed versus non developed sites and quantify development impacts, B) compare highly visited versus visitor restricted sites and quantify numbers of visitors and their activities